DOCUMENT RESUME

ED 169 450 CG 013 396

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TITLE Effects of Evaluation Expectation on Artistic Creativity.
PUB DATE Mar 78
NOTE 20p.; Paper presented at the Annual Meeting of the Eastern Psychological Association (49th, Washington, D.C., March 29-April 1, 1978)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Art Expression; Behavior Change; *Creativity; *Evaluation; *Expectation; *Feedback; Interest Research; Motivation; Research Projects; *Task Performance; Teaching Methods

ABSTRACT

Conditions are examined under which the imposition of an extrinsic constraint upon performance of an activity can lead to decrements in creativity. Female college students worked on an art activity either with or without the expectation of external evaluation. In addition, subjects were asked to focus upon either the creative or the technical aspects of the activity, or they were given no specific focus. Finally, some subjects expecting evaluation were given explicit instructions on how to make their artworks. As predicted, subjects in the evaluation groups produced artworks significantly lower on judged creativity than did subjects in the nonevaluation control groups. The only evaluation group for which this pattern was reversed had received explicit instructions on how to make artworks that would be judged creative. A possible reconciliation of these two disparate results is proposed. (Author)

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Effects of Evaluation Expectation on Artistic Creativity

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Presented at the 49th Annual Meeting of the Eastern Psychological Association in Washington, D.C., March 1978.

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In his autobiography, Albert Einstein describes a serious motivational problem he encountered during his student days: his Physics examinations, forcing him to "cram all this stuff into one's mind," were so unpleasant that afterward he could not bring himself to consider scientific problems for an entire year (Schilpp, 1949). When he went on to advanced study in Zurich, he found ways to blunt the effects of educational constraint, "which smothers every truly scientific impulse" (p. 17). For example, he had a friend who agreed to work over the lecture materials so that Einstein would be freed from attending classes. In commenting upon this arrangement and its boost to his creativity motivation, Einstein later said,

> This gave one freedom in the choice of pursuits until a few months before the examination, a freedom which I enjoyed to a great extent and have gladly taken into the bargain the bad conscience connected with it as by far the lesser evil. It is, in fact, nothing short of a miracle that the modern methods of instruction have not yet entirely strangled the holy curiosity of inquiry; for this delicate little plant, aside from stimulation, stands mainly in need of freedom; without this it goes to wreck and ruin without fail.
>
> (Schilpp, 1949, p. 17)

Einstein's introspections and speculations about scientific inquiry are an elegant expression of the thesis to be advanced here: an intrinsically motivated state is conducive to creativity, while an extrinsically

motivated state is detrimental. That is, if individuals engage in some activity primarily for its own sake, they will be most likely to produce creative work. If, however, they are led to engage in that activity as a means to achieve some salient extrinsic goal, their creative performance will be undermined.

The present conceptualization of creativity proposes that intrinsically motivated individuals will be deeply involved in the activity at hand because they will be free of extraneous and irrelevant concerns, concerns about goals extrinsic to the activity itself. They will be playful with ideas and materials because of their freedom to take risks, to explore new cognitive pathways, to engage in behaviors which might not be directly pertinent to attaining a "solution." Since they undertook the activity primarily for the enjoyment of engaging in it, they will see the activity as more like "play" than like "work." Extrinsically motivated individuals, on the other hand, will be, at some level, concerned with the extrinsic goal to be attained and will thus not be as deeply involved in the activity. In addition, they will feel less free to engage in risk-taking, and will therefore rely more upon well-worn cognitive pathways. Finally, since they undertook the activity primarily for some reason extraneous to the activity itself, they will see it as more like "work" than like "play."

Several social-psychological theorists (Bem, 1972; deCharms, 1968; Kelley, 1967, 1973) have propose' that intrinsic motivation can be affected by environmental factors. They suggest that, under certain conditions, there will be an inverse relationship between the salient external constraints imposed upon an individual's engagement in an activity and that individual's intrinsic motivation to perform that activity. Thus, if people undertake a task in the apparent absence of external controls, they (and those who

observe them) will perceive their behavior as motivated by their intrinsic interest in the task. Conversely, people who perform an activity under salient external constraints will be seen by themselves (and by observers) as motivated by those constraints and not by intrinsic interest.

In keeping with the prevailing definition of intrinsic motivation (see Deci, 1975), this state is generally presumed to be present when an individual engages in an activity in the apparent absence of external controls. Most recent intrinsic motivation research has been concerned with the "overjustification" hypothesis (Lepper, Greene & Nisbett, 1973), derived from the attribution theories of Bem, Kelley, and deCharms. This hypothesis states that, if a person undertakes an interesting task under conditions which make salient to him the instrumentality of his behavior as a means to some extrinsic end, then he will show less intrinsic interest in that activity later, when external constraints are absent, than a person who did not act under salient external constraints. Using the constraint-free measure of subsequent intrinsic motivation, results from a number of studies have supported this hypothesis. Work by several researchers (Condry, 1977; Deci, 1971, 1972; Kruglanski, 1975; Lepper, Greene, & Nisbett, 1973) has demonstrated that subjects who engage in an interesting task with the promise of receiving a tangible reward will later show less intrinsic interest in that task than subjects who were not so rewarded. Other forms of external control have also been demonstrated to decrease intrinsic motivation in a similar manner; in particular, surveillance during task performance (Lepper & Greene, 1975) and the imposition of functionally superfluous deadlines (Amabile, DeJong & Lepper, 1976) can produce decrements in subsequent interest.

Recently, several theorists have begun to speculate about the effects

of extrinsic constraint upon immediate performance. For example, McGraw (1978) has proposed a distinction between two different types of activities, in terms of the differential effects that extrinsic constraint might have upon performance of those activities. McGraw describes tasks having algorithmic solutions as those for which the path to the solution is clear and straightforward; performance on these tasks should be enhanced by increases in extrinsic motivation. By contrast, creativity tasks require heuristic solutions, where it is difficult to immediately determine which operations would be relevant to a solution. Thus, creative performance should be adversely affected by increases in extrinsic motivaiton.

There are a handful of studies which directly test the hypothesis that decrements in creativity will accompany the imposition of extrinsic constraints. Of these, one was an overjustification study which included a measure of creativity in assessing the effects of extrinsic constraints (Kruglanski, Friedman, & Zeevi, 1971). In this experiment, one group of students was promised a reward for participation; for a second group, reward was not mentioned. Rewarded subjects produced less creative responses (as judged by two independent raters) during the experiment than did non-rewarded subjects; in addition, non-rewarded subjects later expressed greater enjoyment for the experiment.

Other studies provide further support for the proposed relationship between creativity and intrinsic motivation. In two experiments where children made drawings under either reward expectation or no reward expectation (Lepper, Greene, & Nisbett, 1973; Greene & Lepper, 1974), there was a tendency for rewarded children to produce more drawings, but of poorer quality (as judged by teachers), than non-rewarded children.

A study of the effects of rewards on problem-solving performance (McGraw & McCullers, 1975) found that rewarded subjects took significantly longer to break set in solving a Luchins water-jar problem than did non-rewarded subjects.

While this research seems to support the intrinsic-motivation view of creativity, studies within the behavior-modification or token-economy traditions have obtained results which appear to contradict it. In one such study (Glover & Gary, 1976), children worked in teams within their classroom. The experimenter explained that a word game would be played, and that the teams would be rewarded points which could win recess and cookies for the members. The students were then taught that responses to the game questions could be scored according to their fluency (number of different responses), flexibility (number of verb forms), elaboration (number of words per response) or originality (statistical infrequency of verb forms). Consistent with the experimental hypotheses, all four aspects were "demonstrated to be under experimental control"; when fluency was rewarded, the children were fluent; when originality was rewarded, they were original, and so on. Under extinction, each aspect fell to baseline or below. Other studies of operant techniques, using both intersubject and between-group designs, have demonstrated functional control over creative performance (Johnson, 1974; Halpin & Halpin, 1973; Raina, 1968).

Thus, a cursory review of evidence on the effects of extrinsic constraint on creativity suggests a basic inconsistency in results. Overjustification studies have generally shown decrements in creativity under reward conditions, while behavior modification studies have shown increments under such conditions. However, as the results of the present study will suggest, a deeper analysis of the two paradigms leads to a

possible resolution of the apparent contradiction.

A closer examination of the procedures used in the overjustification and behavior modification studies suggests that the key to their apparently contradictory results may lie in the type of instructions used. As suggested by the theoretical analyses of McGraw (1978) and others, perhaps subjects will show decrements in creativity if extrinsic constraints are imposed, unless they are told specifically how to perform creatively. In order to examine this hypothesis, the present study attempted, within one experimental design, to show both decrements in creativity by an overjustification procedure and increments in creativity by a behavior modification procedure. In the former, a constraint was imposed upon subjects' engagement in the activity, and they were given no specific performance instructions; in the latter, the same constraint was imposed upon subjects, and they were told specifically how to perform creatively. In accord with the intrinsic motivation model of creativity, it was expected that the simple overjustification groups--the groups working under extrinsic constraint, without explicit instructions on how to perform creatively--would show decrements, relative to control, in both creativity and intrinsic interest. And, as required by the theoretical argument developed here, it was expected that, although the specific-instructions group might show an increment in creativity compared to its control, it should not show a corresponding increment in intrinsic motivation. Thus, the major purpose of this study was to attempt a reconciliation of seemingly contradictory results by identifying those instructional sets under which extrinsic constraint might undermine creativity, and those under which it might enhance creativity. A secondary purpose was to demonstrate that the

creativity shown by subjects under behavior modification procedures is different, in terms of subjects' intrinsic interest, from the creativity shown by subjects working in the absence of extrinsic constraints.

The specific extrinsic constraint employed in this study was the expectation of evaluation. Clearly, this constitutes an externally-imposed constraint which is extrinsic to the activity itself; the external evaluation of an art product is by no means intrinsic to the activity of art itself. The use of this particular constraint is desirable for two reasons. First, expectation of evaluation has seldom, if ever, been used in previous overjustification research. As noted earlier, the extrinsic constraint usually employed is the promise of reward. Second, and most important, the external evaluation of products which may potentially be creative is so commonly employed in education and other settings as to be accepted as a fact of life. Thus, a demonstration of detrimental effects of evaluation could have significant practical implications.

Method

A new subjective method of assessing creativity was devised for use in this study. Subjects are given identical sets of materials and are asked to form a collage using these materials in any way they wish. Artists, working individually, then view these artworks and assign ratings to each on several different artistic dimensions, including creativity and technical competence. These ratings were shown to have high interjudge reliability, and the various dimensions of judgment cluster well on two orthogonal factors obtained in factor analysis: "creativity" and "technical goodness." Creativity judgments were, moreover, distinct from ratings of liking for

the artworks. In addition, unlike tasks used in previous creativity assessment procedures, the production of collages does not appear to depend heavily upon specialized skills. Thus, this task is more amenable to showing motivation-based performance differences.

The extrinsic constraint imposed upon experimental-group subjects in this experiment was the expectation of external evaluation; control-group subjects were told nothing about evaluation. Within each level of evaluation expectation, subjects were asked to focus upon either the technical aspects of the activity or the creative aspects, or they were given no particular focus. Thus, the basic experimental design was a 2 x 3 factorial: 2 levels of evaluation (No Evaluation, Evaluation) crossed with 3 levels of focus (No Focus, Technical Focus, Creativity Focus). Two additional evaluation groups were included as "behavior modification" groups: a Technical Focus group in which subjects were told specifically which technical aspects would be evaluated (organization, neatness, planning, balance, representationalism, and expression of meaning), and a Creativity Focus group in which subjects were told specifically which creativity aspects would be evaluated (novelty of idea, novelty of material use, effort evident, variation in shapes, asymmetry, detail, and complexity). These dimensions were drawn from the factor analysis of judgments derived during pretesting. Thus, the Technical Focus "behavior modification" group was told to concentrate on those aspects which predicted judges' ratings of technical goodness, and the Creativity Focus "behavior modification" group was told to concentrate on those aspects which predicted judges' ratings of creativity.

Subjects were 95 women enrolled in the Introductory Psychology course at Stanford University.

Results

It was expected that, with the exception of the "specific creativity instructions" group, the artworks produced by subjects who expected evaluation would be judged lower on creativity than the artworks produced by subjects who did not expect evaluation. Judge ratings on creativity and the six creativity component dimensions strongly support this hypothesis.

A composite creativity measure was formed by combining the normalized ratings for each of the creativity dimensions: novelty of material use, novelty of idea, effort evident, variation of shapes detail, and complexity. Means for this composite measure are presented in Table 1. An overall analysis of variance for the seven groups excluding the "specific creativity instructions" group (Evaluation-Specific Creativity Focus) was statistically significant, $F(6,84) = 12.13$, $p < .001$. Thus, a planned contrast was performed on these seven groups to test the hypothesis that control groups (nonevaluation) were judged higher on creativity than experimental groups (evaluation). This contrast was clearly significant, $F(1,84) = 45.81$, $p < .001$.

This pattern is borne out by a series of paired comparisons between control groups and the relevant experimental groups. As expected, only when evaluation subjects are given specific instructions on how to make a creative design do they produce artworks judged as significantly more creative than those of nonevaluation subjects. The mean rated creativity for this specific-instructions group (Evaluation-Specific Creativity Focus) is significantly higher than that of the relevant control, $t(14) = -3.88$, $p < .01$; indeed, this group is higher than any other on judged creativity. In all other cases, the nonevaluation groups are significantly higher on judged creativity than the comparable evaluation groups: for the No Focus

Table 1

Mean Judge Ratings of Creativity

	Instructions Focus				
Evaluation Expectation	No Focus	Technical Focus	Creativity Focus	Specific Technical Focus	Specific Creativity Focus
Absent	.356	.181	.160		
Present	-.499	-.056	-.472	-.466	.777

Note: These numbers are the means of composites of six normalized components of creativity which clustered on the factor analysis.

groups (Nonevaluation-No Focus vs. Evaluation-No Focus), $t(14) = 9.44$, $p < .001$; for the Technical Focus groups (Nonevaluation-Technical Focus vs. Evaluation-Technical Focus), $t(14) = 2.074$, $p < .06$; (Nonevaluation-Technical Focus vs. Evaluation-Specific Technical Focus), $t(14) = 3.62$, $p < .01$; and for the Creativity Focus groups (Nonevaluation-Creativity Focus vs. Evaluation-Creativity Focus), $t(14) = 3.79$, $p < .01$.

Several items on a questionnaire administered to subjects just prior to debriefing were intended to measure their attitude towards the art activity. A composite intrinsic interest measure was formed using six of these items; all six loaded higher than .50 on the "intrinsic interest" factor obtained in a factor analysis of questionnaire items, and they all correlated significantly with one another. The composite scores were formed by first normalizing scores on each of the six items, adding the z-scores of the first five items for each subject and subtracting the z-score of the sixth item, and finally dividing each subject's sum by six.

Means for this composite measure are presented in Table 2. It was expected that, overall, the control groups (nonevaluation) would be higher in self-rated interest than the experimental groups (evaluation). Recall that, on the creativity measure, the "specific creativity instructions" group (Evaluation-Specific Creativity Focus) was expected to be an exception to the general pattern. This exception was not predicted on the intrinsic interest measure, however. On the contrary, it was expected that even though the "specific creativity instructions" subjects might exhibit superior creativity in accord with their task instructions, their intrinsic interest would still be undermined by evaluation expectation.

Table 2

Mean Self-ratings of Intrinsic Interest

Evaluation Expectation	Instructions Focus: Focus	Technical Focus	Creativity Focus	Specific Technical Focus	Specific Creativity Focus
Absent	.311	.294	-.059		
Present	-.184	.222	.207	-.568	-.158

Note: These numbers are the means of composites of six normalized measures of intrinsic interest which clustered on the factor analysis of questionnaire items.

This overall pattern of results was, in fact, obtained. An analysis of variance on all eight groups yielded a significant overall effect, $F(7,87) = 2.68$, $p < .025$, and a planned contrast testing the specific trend of nonevaluation groups being higher on intrinsic interest than evaluation groups was statistically significant, $F(1,87) = 4.08$, $p < .05$.

In comparison with the creativity results, however, the intrinsic interest results are not as strong. Indeed, only two experimental-control paired comparisons are statistically significant: that for the two No Focus groups (nonevaluation-No Focus vs. Evaluation-No Focus), $t(22) = 2.07$, $p < .05$, and that for the Specific Technical Focus group and its control (Nonevaluation -Technical Focus vs. Evaluation-Specific Technical Focus), $t(22) = 2.77$, $p < .02$.

Despite the failure of specific comparisons, however, the overall planned contrast suggests that it is reasonable to assert that intrinsic interest was undermined by evaluation expectation in this study. This result is particularly important when the two "specific instructions" groups are considered: although the technical instructions group (Evaluation-Specific Technical Focus) was very high on rated technical goodness, and the creativity instructions group (Evaluation-Specific Creativity Focus) was very high on creativity, both of these groups were quite low on intrinsic interest. In other words, as predicted, the "specific creativity instructions" group (Evaluation-Specific Creativity Focus) did not exhibit a high level of intrinsic interest to match its high level of creativity. Thus, while intrinsic interest generally corresponds with rated creative performance in the other groups, the two do not seem to be in correspondence for the group that produced creativity on demand.

Discussion

The main hypothesis of the present study--that, under nonspecific instructional sets, the expectation of external evaluation will lead to decrements in creativity--was strongly supported by the artist-judges' ratings of creativity. Whether subjects were given no particular focus, a technical focus, or a creativity focus in their instructions, subjects in the evaluation conditions were, overall, rated lower on creativity than subjects in the nonevaluation conditions. In keeping with the theoretical analysis presented earlier, only the "specific creativity instructions" evaluation group (Evaluation-Specific Creativity Focus) was higher than its nonevaluation control on rated creativity. Thus, the present results suggest a reconciliation between the seemingly contradictory findings on the effect of constraint on creativity provided by the overjustification and behavior modification literatures.

The behavior modification studies appeared to demonstrate that creativity can be increased by the offer of rewards for creative performance. This conclusion, clearly, contradicts the intrinsic motivation view of creativity: that the imposition of extrinsic constraints (such as rewards or external evaluation) can lead to decrements in creativity. The key to the reconciliation lies in the nature of the task, and the nature of the instructions given. In accord with the present thesis, if a "creative" performance depends upon some degree of risk-taking and set-breaking--some level of production beyond the obvious and commonplace--the imposition of salient extrinsic constraints, establishing an extrinsic motivation, will result in lower levels of creativity. In order to necessitate a spontaneously creative performance, a task must have some degree of ambiguity--a nonobvious solution or method of approach. (In McGraw's (1978) terms, it must require a <u>heuristic</u> rather than an <u>algorithmic</u> solution.)

This was clearly not the case in the behavior modification studies cited earlier, and it was not the case in the "specific creativity instructions" condition in the present study.

The behavior modification studies, for the most part, used verbal tests of creativity. The instructions given to children under reward conditions in those studies effectively eliminated any ambiguity about what constituted a good ("creative") performance; if the experimenters wanted to demonstrate that "fluency" was under experimental control, they told the children that they would be rewarded for producing large numbers of ideas. Not at all remarkably, children produced large numbers of ideas under these conditions. And, apparently, the instructions given to the "specific creativity instructions" group in the present study also succeeded in reducing the ambiguity in the task; subjects were told to come up with a novel idea, to use the materials in a novel way, to make a detailed and complex design, and so on. Since, as was evident from pretest results, judges considered complex, detailed designs with novel ideas and novel use of materials to be creative, this group achieved very high creativity scores. What is crucial here is that, within the same experimental design, when subjects were given evaluation instructions but not told specifically what to do, their creativity was dramatically lower. And, when subjects did not expect evaluation, their creativity remained high--no matter what they were asked to focus on.

Taken together, the creativity, technical goodness, and intrinsic interest results suggest a coherent pattern: in the absence of a specific focus, people may be less creative, less technically competent, and less interested in an activity if they are led to engage in it under the salient expectation of external evaluation--a situation which is repeated many

times every day in classrooms and businesses and numerous other settings. This result would obtain, of course, in relation to other people who engaged in the same intrinsically interesting activity without expecting evaluation in any salient fashion. If people are asked to concentrate on producing a technically good result, they may be more technically competent under evaluation expectation, but they will still be less creative and less interested than those not expecting evaluation. And, if people are asked to concentrate on producing a creative result, they may be more creative under evaluation conditions--but only if they are told exactly what to do to be creative, and they will be less technically competent than those not expecting to be evaluated. Finally, those working under a creativity evaluation expectation may be less interested in the activity, especially if they are given explicit instructions.

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